

TRANSLATION

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>11660p</b>	<b>FOR FURTHER ACTION</b>		See Form PCT/IPEA/416
International application No. <b>PCT/DE2004/002672</b>	International filing date (day/month/year) <b>06.12.2004</b>	Priority date (day/month/year) <b>06.12.2003</b>	
International Patent Classification (IPC) or national classification and IPC <b>H01L31/10, H01L31/0224, H01L31/02, H01L27/144</b>			
Applicant <b>X-FAB SEMICONDUCTOR FOUNDRIES AG</b>			

<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <b>5</b> sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> (<i>sent to the applicant and to the International Bureau</i>) a total of <b>5</b> sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (<i>sent to the International Bureau only</i>) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>
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<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the report</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>
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Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/DE2004/002672

## Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
 

This report is based on translations from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of:
 
  - international search (Rule 12.3 and 23.1(b))
  - publication of the international application (Rule 12.4)
  - international preliminary examination (Rule 55.2 and/or 55.3)
2. With regard to the **elements** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):
 

the international application as originally filed/furnished

the description:
 

pages 1-5 \_\_\_\_\_ as originally filed/furnished

pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

the claims:
 

nos. \_\_\_\_\_ as originally filed/furnished

nos.\* \_\_\_\_\_ as amended (together with any statement) under Article 19 30.11.2005 with letter of 29.11.2005

nos.\* 1-19 received by this Authority on \_\_\_\_\_

nos.\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

the drawings:
 

sheets 1/3-3/3 \_\_\_\_\_ as originally filed/furnished

sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.
3.  The amendments have resulted in the cancellation of:
 

the description, pages \_\_\_\_\_

the claims, nos. \_\_\_\_\_

the drawings, sheets/figs \_\_\_\_\_

the sequence listing (*specify*): \_\_\_\_\_

any table(s) related to sequence listing (*specify*): \_\_\_\_\_
4.  This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
 

the description, pages \_\_\_\_\_

the claims, nos. \_\_\_\_\_

the drawings, sheets/figs \_\_\_\_\_

the sequence listing (*specify*): \_\_\_\_\_

any table(s) related to sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.  
PCT/DE2004/002672Box No. V **Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

## 1. Statement

Novelty (N)	Claims	1-19	YES
	Claims		NO
Inventive step (IS)	Claims	1-19	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-19	YES
	Claims		NO

## 2. Citations and explanations (Rule 70.7)

Reference is made to the following documents:

D1: KYOMASU M: "DEVELOPMENT OF AN INTEGRATED HIGH SPEED SILICON PIN PHOTODIODE SENSOR" IEEE TRANSACTIONS ON ELECTRON DEVICES, IEEE INC. NEW YORK, US, Vol. 42, No. 6, 1 June 1995 (1995-06-01), pages 1093-1099, XP000517156 ISSN: 0018-9383

D2: WO 02/33755 A (AUGUSTO, CARLOS, J., R., P; FORESTER, LYNN) 25 April 2002 (2002-04-25).

Document D1 is considered the prior art closest to the subject matter of claim 1. It discloses (the references between parentheses relate to D1) a photodetector having a monolithic chip integration structure, wherein the photodetector has an actual photo cell part, which can be reached in a light-transmitting manner from a side of the chip from which a light arrives; an electronic circuit part in an electronic evaluation system, which is disposed on the opposite side of the chip, and electrical connections between the photo cell part and the electronic circuit part (see D1, abstract, figure 1 and pages 1093-1096).

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**Box No. V** **Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

The subject matter of claim 1 therefore differs from document D1 in that the electrical connection between the photo cell part and the electronic circuit part extends parallel to a vertical axis and perpendicular to the chip plane.

Consequently, the subject matter of claim 1 is novel (PCT Article 33(2)).

The problem to be solved by the present invention is therefore understood to be that of making the photodetector more compact and easier to manufacture. Consequently, the subject matter of claim 1 involves an inventive step (PCT Article 33(3)).

Claims 2-6 are dependent on claim 1 and therefore likewise meet the PCT requirements for novelty and inventive step.

The subject matter of claim 7 describes a method for producing a photodetector according to claim 1, and hence the subject matter of claim 7 is likewise novel and inventive within the meaning of PCT Article 33(2) and (3).

Claims 8 and 9 are dependent on claim 7 and therefore likewise meet the PCT requirements for novelty and inventive step.

The subject matter of independent claims 10 and 17 corresponds to that of claims 1 and 7, and therefore the

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**Box No. V** **Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

subject matter of claims 10 and 17 is likewise novel and inventive (PCT Article 33(2) and (3)).

Claims 11-16 are dependent on claim 10 and claims 18 and 19 are dependent on claim 17. Consequently, claims 11-16, 18 and 19 likewise satisfy the PCT requirements for novelty and inventive step.